

# ADVANCED MATERIALS IN UTAH



# From Aerospace to Outdoor Products, Utah Knows Composites

### Industry

- Utah is proud to be home to companies like **Boeing, Orbital ATK, Hexcel, Black Diamond, Kihomac**, and many others. Beginning with the strategic missile programs of the 1950's, Utah has grown to one of the highest concentrations of advanced materials companies in the nation and is home to more than 14,000 workers employed by advanced materials-related firms.
- The Utah Aerospace Composites Industry Working Group (ACWG)** meets quarterly to advocate for aerospace composites industry issues in Utah. The **Utah Advanced Materials and Manufacturing Initiative (UAMMI)** supports the advanced materials industry by bringing together public, private, community, industry, and education partners to assure growth in the sector.
- Utah has a thriving Advanced Materials industry that serves the **Aerospace, Outdoor Products, and Renewable Energy industries**. These three complementary industries, with their strong ties to the advanced materials market, allow for a strong local customer base for relocating and expanding companies.



### Business Climate

- Forbes Magazine has recognized Utah as **“The Best State for Business”** six of the past eight years, ranking 3rd in 2018.

### ON THE COVER

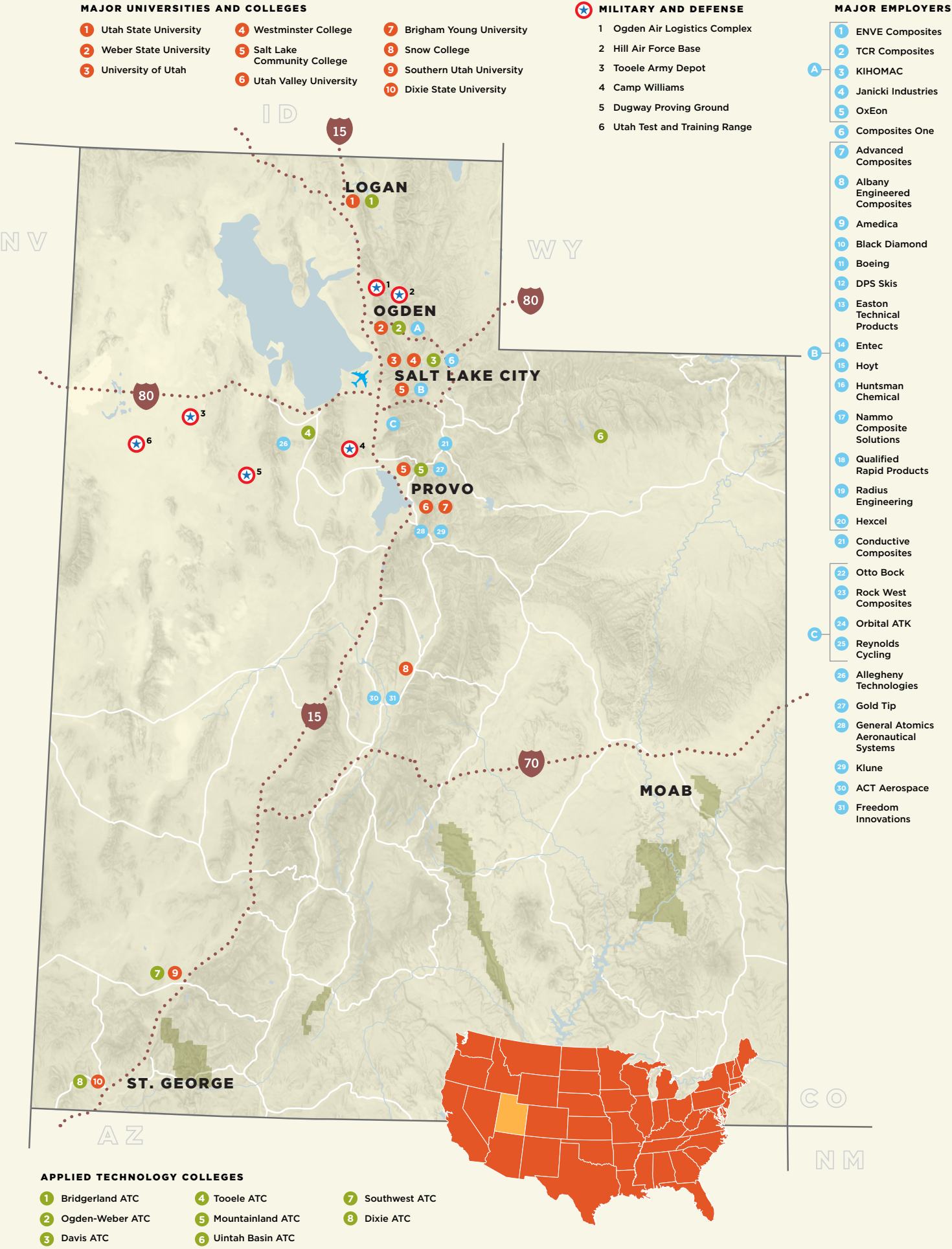
#### Nammo Composites Drive Shaft

Carbon composite attached to bright orange aluminum alloy. Made to handle the extreme movement and temperature found within the transmission of a high-end sportscar.

- In 2015, Utah's post-performance tax incentives facilitated nearly **25,000 new jobs and more than \$65M in new state revenues**.
- In 2018, the Tax Foundation ranked Utah's Total Tax Climate as the **8th best in the nation**. Since 2011, Utah has eliminated or modified nearly 400 business regulations to ease the burdens placed on businesses.

### Workforce

- Utah has high employee concentrations of materials engineers, materials scientists, engineering technicians, and many other advanced materials related occupations. **Utah also has the 9th lowest unionization rate in the country at 3.9% (2017).**
- Six colleges and universities** from around the state offer training and specialized programs in the composites field and annually graduate hundreds of qualified workers at all levels of education and experience. Additionally, the state's science, technology, and research initiative (USTAR), and University Tech Transfer programs spin out more next-generation technology than any others in the nation.
- Utah has an abundance of advanced materials companies working in the aerospace and outdoor products industries that have **industry recognized expertise** in advanced materials applications.



Major Advanced Materials Employers

COMPANY	EMPLOYEES*	DESCRIPTION
ACT Aerospace	100-249 map #30	ACT Aerospace fabricates advanced composite structures including hand layed-up laminate construction, filament winding, composite compression molding and large oven curing.
Advanced Composites	50-99 map #7	Advanced Composites is a filament winding company that specializes in aerospace, defense, and commercial applications.
Albany Aerostructures Composites	500-999 map #8	Albany Aerostructures Composites designs, develops, and manufactures advanced composite components for commercial and military structures for Boeing, Lockheed, Sikorsky, USAF, Airbus, and others.
Allegheny Technologies	100-249 map #26	Allegheny Technologies is a specialty materials and component supplier, specializing in titanium and titanium alloys.
Amedica	20-49 map #9	Amedica is a manufacturer of silicon nitride based medical implants that are fully FDA approved for spinal surgery with a wide variety of devices and systems.
Black Diamond	250-499 map #10	Black Diamond designs and manufactures outdoor gear including carbon composite skis and climbing equipment.
Boeing	1000-1999 map #11	Boeing's Utah composites manufacturing site focuses on fabrication of composite vertical fin and horizontal stabilizer components for the 787-9 Dreamliner.
Composites One	20-49 map #6	Composites One is a distributor of composite materials of all types. They have strong technical product support and local services including: product data, process audits, compliance, and regulatory consulting.
Conductive Composites	20-49 map #21	Conductive Composites is a manufacturer of conductivity-based polymer and composites used in aerospace, defense, and specialty construction.
DPS Skis	20-49 map #12	DPS Skis designs and manufactures snow skis for ultra high performance skiing using a fusion of space-age carbon fiber technology and groundbreaking shaping strategies.
Easton Technical Products	250-499 map #13	Easton Technical Products manufactures arrow shafts and archery accessories, as well as backpacking tents, snowshoes, trekking poles, and precision OEM tubing.
Entec / Toray	20-49 map #14	Entec is a filament winding machine manufacturer that has developed and supported machinery for pultrusion, fiber placement, spool winding, towpreg and prepreg production, fiberglass pipe, and tank production.
ENVE Composites	100-249 map #1	ENVE Composites manufactures carbon fiber bicycle products including frames, wheels, components, and accessories.
Freedom Innovations	50-99 map #31	Freedom Innovations develops lower limb prosthetic solutions in close collaboration with prosthetists and amputees.
General Atomics Aeronautical Systems	100-249 map #28	General Atomics Aeronautical Systems manufactures Remotely Piloted Aircraft (RPA) systems, radars, and electro-optic and related mission systems solutions.
Gold Tip	50-99 map #27	Gold Tip manufactures carbon graphite equipment for archers and bow hunters, specializing in high quality carbon arrows.
Hexcel	500-999 map #20	Hexcel manufactures lightweight, high performance composites including carbon fibers, reinforcements, prepregs, honeycomb, matrix systems and adhesives.

\*SOURCE: Utah Department of Workforce Services



COMPANY	EMPLOYEES*	DESCRIPTION
Hoyt USA	100-249 map #15	Hoyt USA is a sporting goods manufacturer that utilizes composite technology to manufacture archery equipment.
Huntsman Chemical	20-49 map #16	Huntsman Chemical is a global chemical company with a broad range of resins and other products for the advanced materials industry. Their corporate headquarters is in Salt Lake City.
Janicki Industries	50-99 map #4	Janicki Industries is an Engineering and Manufacturing company, specializing in advanced composite materials and exotic metals.
KIHOMAC	250-499 map #3	KIHOMAC specializes in prototype development and manufacturing for US government customers requiring high engineering content and specialty machining.
Klune	100-249 map #29	Klune manufactures metal and composite machine parts and assemblies for the aerospace and defense industries.
Nammo Composite Solutions	50-99 map #17	Nammo Composite Solutions designs and builds advanced integrated composite structures using the processes of filament winding, resin transfer molding (RTM), autoclave cure, and bladder molding for a broad range of products.
Orbital ATK	2000-2999 map #24	Orbital ATK designs, manufactures, and tests commercial, military, and launch vehicle composite aerospace structures for Boeing, Lockheed, Airbus, and Rolls-Royce.
Otto Bock	100-249 map #22	Otto Bock uses composite materials to manufacture prosthetics such as a modular lower limb prosthesis, myoelectric arm prosthesis, C-Leg, Genium leg prosthesis system, Michelangelo Hand, and the mechatronic C-Brace orthotronic mobility system.
OxEon	10-19 map #5	OxEon is an advanced materials company that develops solid oxide ceramics for fuel cell and hydrogen / syngas generation applications.
Qualified Rapid Products	10-19 map #18	Qualified Rapid Products is a turn-key 3D metal printed parts supplier for performance critical parts.
Radius Engineering	20-49 map #19	Radius Engineering provides mold tooling and injection systems for automobile seat frames, sailboat masts, prosthetic hands, ski poles and grips, archery bows, tennis racquets, bicycle frames, fishing poles, violin bows, airplane wings, and many more.
Reynolds Cycling	20-49 map #25	Reynolds Cycling uses composites to produce bicycle wheels and accessories, including the use of unidirectional carbon fiber technology in bicycle rims.
Rock West Composites	20-49 map #23	Rock West Composites designs, engineers, and manufactures composite products for nearly any application, specializing in rods, tubes, and plates.
TCR Composites	50-99 map #2	TCR Composites develops prepregs with long out-life to solve the challenges with building large rocket motor cases, as well as new resin systems that are being used in a wide variety of applications across the commercial and aerospace industries.

\*SOURCE: Utah Department of Workforce Services



Two of Nammo's many products:  
Left: The PA179-IM munitions canister for 70mm aerial rockets. Right: Carbon fiber control arm for a custom, high-end automobile restoration.



Nasa's Composite Cryotank Development Project (CCDP) approached Janicki Industries to design a series of low-cost prototype tooling.



ENVE Composites, located in Ogden, UT designs and hand builds carbon wheels and component systems for mountain and road bikes.



## Recent Announcements



### **UAMMI Awarded \$1M Grant to Produce Legacy Airplane Parts using 3D Carbon Fiber Printing** (2018)

The Utah Advanced Materials & Manufacturing Initiative (UAMMI) will use a state-of-the-art 3D carbon fiber based printing process to produce parts for out-of-production military aircraft. The grant comes from the National Center for Defense Manufacturing & Machining and the system will be located in the USTAR Innovation Center adjacent to Hill Air Force Base.

### **Orbital ATK Celebrates Delivery of 5,000th Part for Lockheed Martin F-35 Aircraft** (2018)

In February 2018, Orbital ATK marked completion of high performance composite wing skins, engine nacelles, access covers and other parts representing 490 ship sets for the F-35 Lightning II. These parts are then finished by Janicki Industries in their Utah precision machining facility before delivery to prime contractor Lockheed Martin. Orbital ATK's advanced automated fiber placement machines have played a critical role in reaching and maintaining the high production rates required on the F-35 program.

### **Boeing Completes 200th All-Composite 787 Vertical Fin in Salt Lake City** (2017)

Boeing's three commercial airplane manufacturing facilities in Utah employ 700 people. Production lines for 787-9 and 787-10 horizontal stabilizers, and a third for the 787 vertical fin, operate side by side in the Airport factory. Components are added to the tail structures, which are tested for quality, assembled for fit checks, and then disassembled. The site ships out up to 14 sets of horizontal stabilizers each month to factories around the nation.

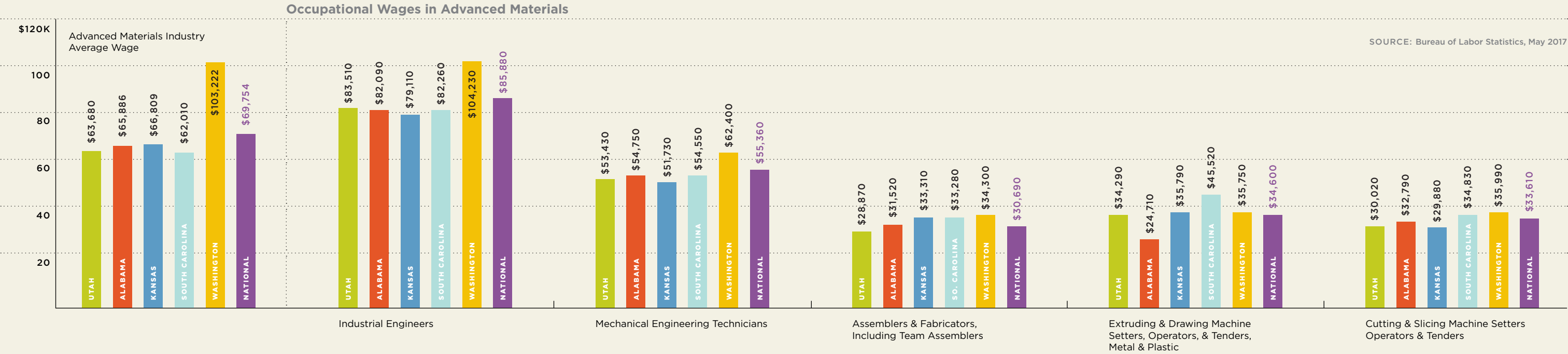
### **ENVE Composites Launches Revolutionary New Carbon Bike Wheels** (2017)

World leader in ultra-high performance, handmade carbon fiber bicycle rims and components, ENVE announced the all-new M Series, featuring game changing technology that promises to all but eliminate pinch flats forever. Designed for the toughest mountain biking and road cycling environments, ENVE wheels are used by professional and amateur cyclists worldwide.

### **Orbital ATK delivers 100,000th part for Airbus A350** (2016)

Orbital ATK's Aerospace Structures Division (ASD) and Airbus Americas celebrated the completion of the 100,000th composite part for the A350 XWB program. These composite stringers and frames, the equivalent of more than 140 ship sets, use Orbital ATK's proprietary and patented automated stiffener forming machines (ASFM) which have been instrumental in the development and manufacture of high-rate production of precision composite parts.

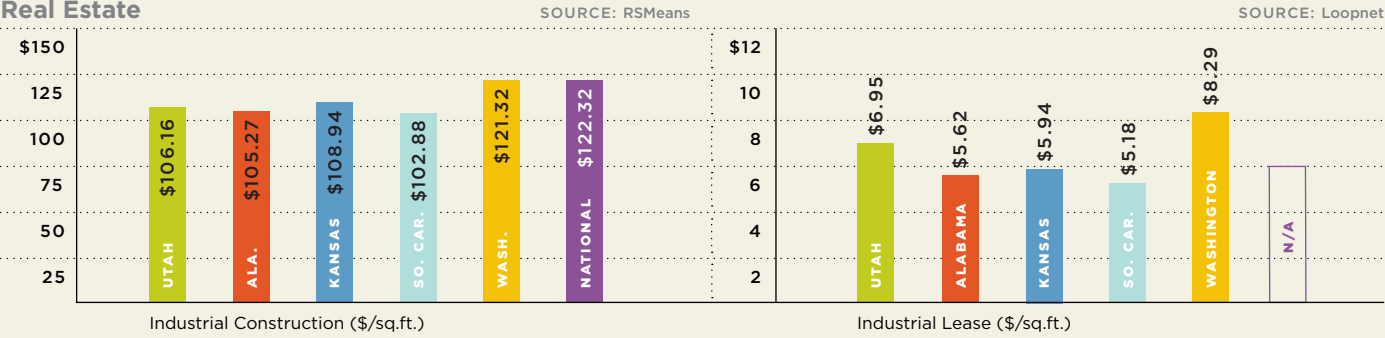
# Cost Profile



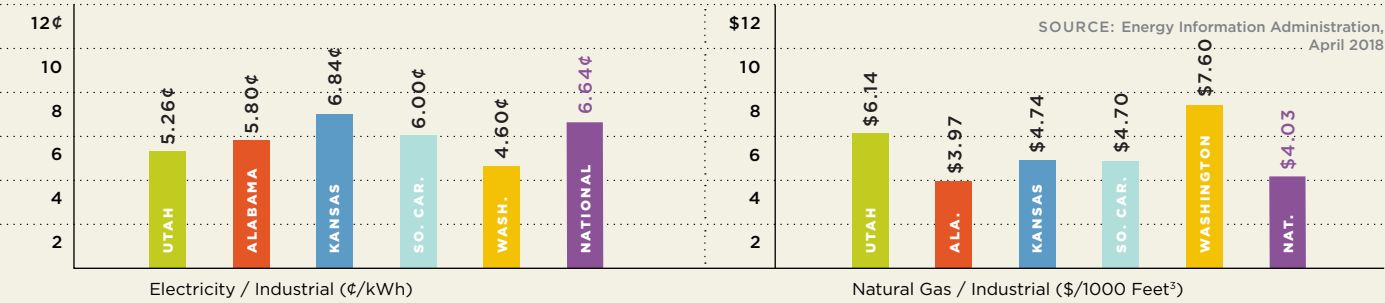
## Other Comparative Wages in Advanced Materials

OCCUPATION	UTAH	ALABAMA	KANSAS	SOUTH CAROLINA	WASHINGTON	NATIONAL
Industrial Production Managers	\$87,270	\$96,300	\$89,330	\$111,530	\$117,370	\$100,580
Mechanical Engineers	\$84,430	\$85,750	\$75,340	\$82,940	\$89,100	\$85,880
Industrial Engineering Technicians	\$59,660	\$57,920	\$52,230	\$49,270	\$57,000	\$54,280
First-Line Supervisors of Production and Operating Workers	\$56,090	\$57,290	\$57,190	\$61,960	\$68,390	\$58,870
Cutting Punching and Press Machine Setters Operators and Tenders Metal and Plastic	\$33,840	\$30,160	\$31,420	\$34,800	\$39,660	\$33,060
Machinists	\$47,850	\$42,340	\$40,180	\$36,940	\$49,070	\$42,600
Molding Coremaking and Casting Machine Setters Operators and Tenders Metal and Plastic	\$31,650	\$29,550	\$29,360	\$34,200	\$35,260	\$31,090
Inspectors, Testers, Sorters, Samplers, & Weighers	\$35,360	\$29,330	\$42,250	\$35,970	\$52,520	\$37,340

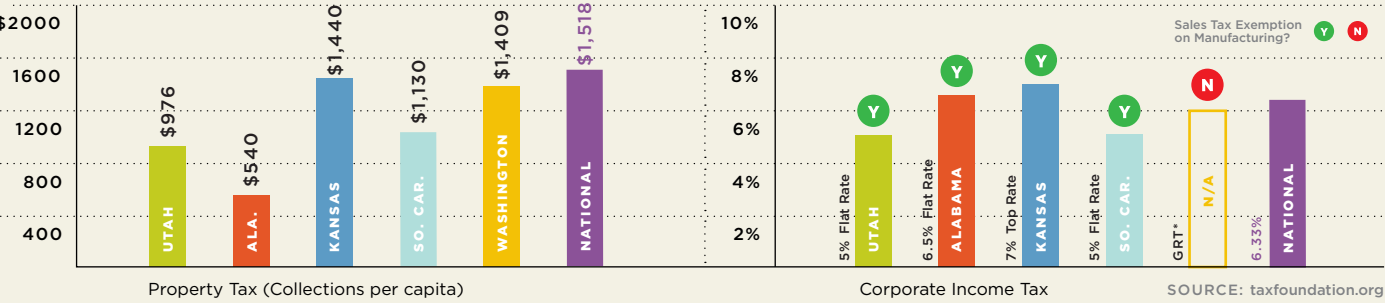
## Real Estate



## Utilities



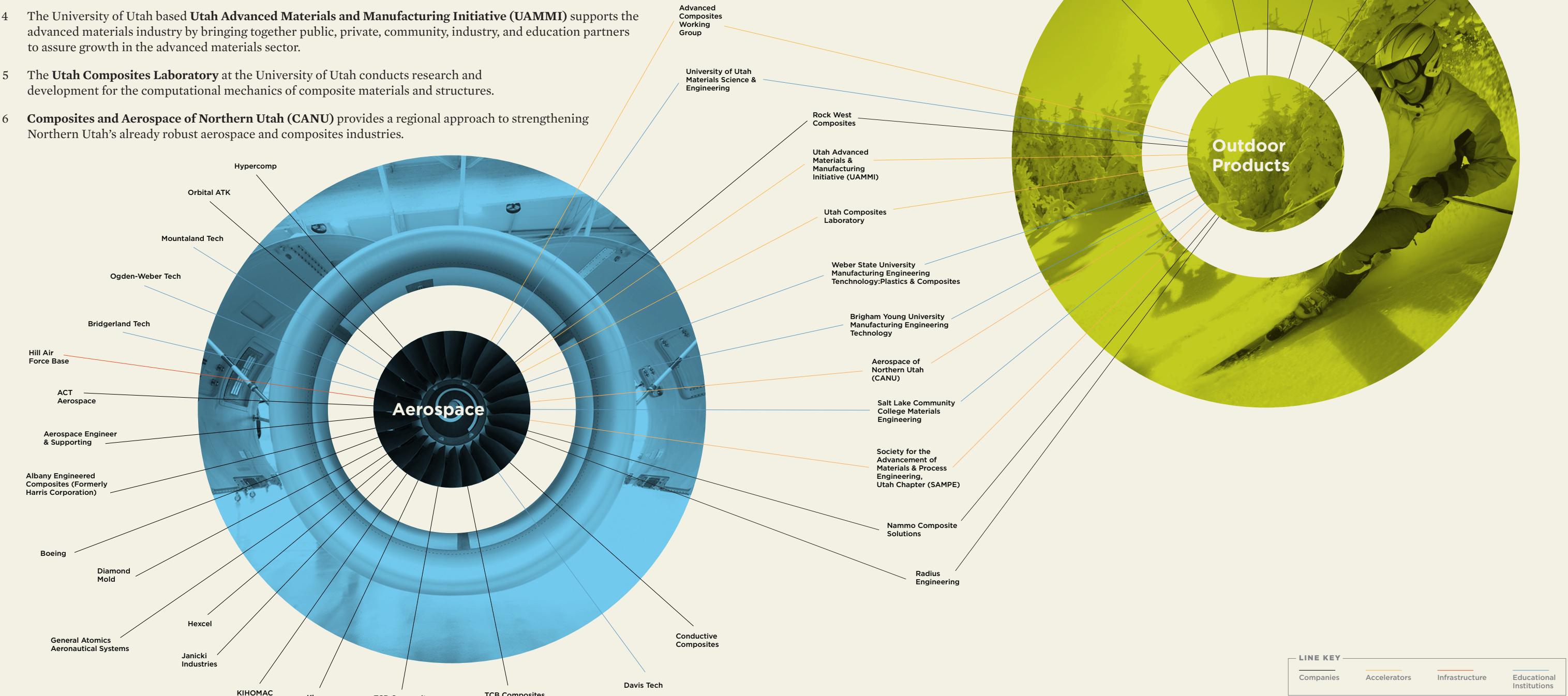
## Taxes



# Areas of Excellence

“Areas of Excellence” are industry sub-sectors in which Utah has a competitive advantage due to our infrastructure, trained workforce, historical expertise, and community support. The diagram below shows the collaboration and interrelationship of Utah’s business accelerators, educational institutions, government initiatives, and companies within the advanced materials industry.

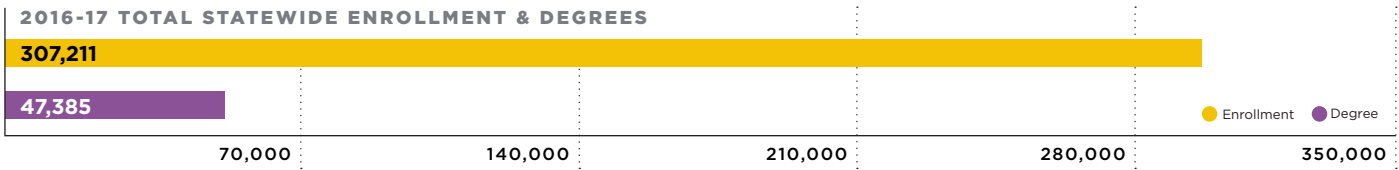
- 1 The HAFB **Composites Engineering and Repair Facility** has system-wide responsibility for major airframe programs and upgrades.
- 2 The **Advanced Composites Working Group** meets often to address industry concerns and determine initiatives that keep the industry thriving.
- 3 **The Society for the Advancement of Material and Process Engineering (SAMPE)** is a professional member society that provides a unique and valuable forum for scientists, engineers, and academic leaders.
- 4 The University of Utah based **Utah Advanced Materials and Manufacturing Initiative (UAMMI)** supports the advanced materials industry by bringing together public, private, community, industry, and education partners to assure growth in the advanced materials sector.
- 5 The **Utah Composites Laboratory** at the University of Utah conducts research and development for the computational mechanics of composite materials and structures.
- 6 **Composites and Aerospace of Northern Utah (CANU)** provides a regional approach to strengthening Northern Utah’s already robust aerospace and composites industries.



# Education & Labor

## A State of Education

Utah is home to **12 major colleges and universities** and has an excellent talent pipeline of over **307,000** students. Bachelor's and graduate awards grew by **30.8% over the last five years**. Utah has an educated workforce, with over 91% of the population 25 or over with a high school diploma and over 32% with a bachelor's degree.



## TOP THREE INSTITUTIONS WITH ADVANCED MATERIALS-RELATED DEGREES

### University of Utah

DEGREE: Materials Science & Engineering

The Materials Science and Engineering degree prepares students with the ability to use the techniques, skills, and modern engineering tools necessary in materials engineering practices.

### Weber State University

DEGREE: Manufacturing Engineering Technology: Plastics & Composites

The Manufacturing Engineering Technology: Plastics and Composites degree teaches students firsthand about the complex interdependence between the plastic/composite process, materials, tooling and part design.

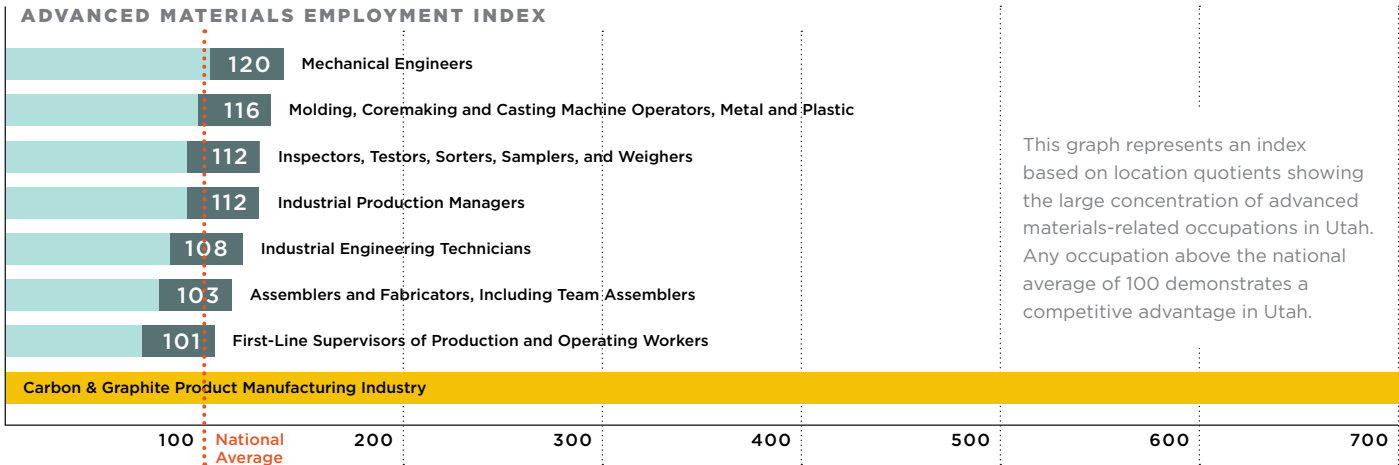
### Brigham Young University

DEGREE: Mechanical Engineering

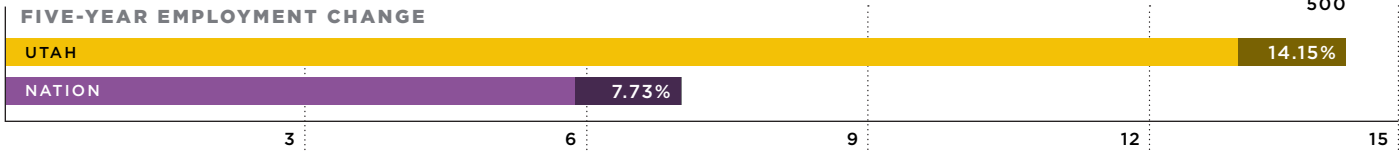
Brigham Young University is deeply involved in research in the composites industry. The engineering materials group develops novel processing techniques to prepare advanced materials using cutting edge microscopy to determine material structure at the nano-scale.

## The Labor Picture

Utah's labor force is well educated, growing, and affordable. Utah **created nearly 40,000 jobs in 2017** and maintained one of the highest job growth rates in the nation throughout the year. Utah is the youngest state in the nation with a median age of 30.7 and has an average wage of \$46,068, which is **15% lower than the national average**.



This graph represents an index based on location quotients showing the large concentration of advanced materials-related occupations in Utah. Any occupation above the national average of 100 demonstrates a competitive advantage in Utah.



SOURCE: Bureau of Labor Statistics

Easton Technical Products brings its burgeoning knowledge of advanced materials to the worlds of archery, backpacking, and showshoeing.





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801-323-4250



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Have questions about the Advanced Materials industry  
in Utah? Call us at 1-800-574-8824

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